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THE OPERATIONAL FACTORS IN THE 2015 AMPHIBIOUS TASK FORCE

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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2

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THERE EXISTS CURRENTLY A SERIOUS DEBATE REGARDING THE POTENTIALITIES OF NET-CENTRIC WARFARE FOR UNITED STATES NAVAL FORCES. ASSUMING THE INEVITABILITY OF AN INFORMATION CAPABLE MILITARY FORCE, AND USING A POTENTIAL FUTURE SECURITY ENVIRONMENT AS A BACKDROP, I DESIRED TO INVESTIGATE THE ADVANTAGES ASSOCIATED WITH A RUDIMENTARILY NETTED FORCE. DURING THE COLLECTION OF RESEARCH FOR THIS ENDEAVOR, HOWEVER, I RECOGNIZED THE REQUIREMENT TO BALANCE MY VIEWS WITH WHAT I CONSIDER POTENTIAL UNINTENDED CONSEQUENCES.

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Abstract of

THE OPERATIONAL FACTORS IN THE 2015 AMPHIBIOUS TASK FORCE

There exists currently a serious debate regarding the potentialities of net-centric warfare for United States Naval forces. Assuming the inevitability of an information capable military force, and using a potential future security environment as a backdrop, I desired to investigate the advantages associated with a rudimentarily netted force. During the collection of research for this endeavor, however, I recognized the requirement to balance my views with what I consider potential unintended consequences.

An examination of the operational factors in 2015, with a characterized and rational force and a plausible security environment, revealed the necessity for including information as an operational factor. It further recognized the emergence of information superiority as a precursor to military operations.

The discussion concludes with observations regarding the potentialities, both positive and negative, of a netted force. While the intent of the paper is not to beg a force structure modification, nonetheless, it is apparent that serious fiscal and procurement decisions must be made now in order to realize a basic capability by 2015. The human factor must also be factored into any change in operational concepts outlined in current Navy theory.

We are moving forward technologically by leaps and bounds and at the same time may be moving backward in conceptual employment of this netted force. Consequently, the operational level of war, as we know it today, may become quickly a topic of historical discussion.

Introduction. This paper examines the operational factors of time, space, and force in a potential future environment with a predicted future force. My locus will be an Amphibious Task Force (ATF) and embarked Landing Force (LF) functioning at the operational level of war. From the study conducted in satisfaction of this requirement, I believe a similar organization and structure will continue to be the mainstay of the United States forward-deployed naval presence in 2015.[1] My research was accordingly skewed towards naval forces.

While the force used in this paper is an Amphibious Task Force, the concepts expressed concerning operational factors as they currently exist and as I envision them in the 2015 netted force can be applied to any Joint Force or large military formation.

My thesis is that operational factors in the net-centric Amphibious Task Force (ATF) of 2015 will be considered in a much different manner than today. Specifically, the factor of time will take on greater import in an environment in which information flow is extremely rapid. Time will become a byproduct of information superiority to be leveraged by the operational commander. Information will become a fourth factor that will significantly influence the 2015 commander. Information will affect the analysis and execution of assigned operational missions, and these missions will differ significantly from those discussed today.

To realize this, I will forecast a future security environment as well as the naval amphibious force structure and associated capabilities I believe will exist in 2015. While the force structure is generally mandated by the POM and open to some marginal disagreement, the 2015 security environment is fully open to debate. My intent, therefore, is to frame the environment generally and the force closely in order to rationally bound this discussion.

Once the security environment and force capabilities are granted, I will examine the operational factors in future operations. Again, in order to accomplish this, I must include a brief discussion of these factors as they exist today for purposes of comparison.

I will conclude this effort, not with a statement of deduced revelation or of divined fact, but rather with a brief discussion of the potentialities of the net-centric force and the consequences it could have on the operational level of war as known today. I will discuss some potentially unintended issues of the proposed netted force on the operational level commander.

A Possible 2015 Security Environment. The emergence of a Large Peer Competitor by 2015 is remote. Korea and the Middle East will likely remain potential flash points for major traditional combat operations.[2] The United States will remain both willing and able to continue active engagement--diplomatic, economic, informational, and militarily. The future will not evolve in the linear manner expected, nor will it evolve according to current trends and conditions. The path to the future will fundamentally be non-linear and, if historical trends remain true, the future I forecast will likely be partially wrong.[3] For clarification, I believe that the linear extrapolation of recent world events we see frequently used for threat modeling and force structuring is unlikely to yield an accurate depiction of our future security environment. Applying the tenets of chaos theory in a predictive model forces us back to the linear extrapolation I seek to avoid. I will furnish, therefore, one possible version of the future as the backdrop against which I will examine the operational factors. To discuss the security environment, the notion of linearity must be rejected and the reader must, in essence, make a "leap of faith."

The security environment we will likely face in 2015 will be characterized by continued uncertainty, extremely rapid social, economic and informational change, and chaos, especially in the littorals.[4] Resource competition will increase the likelihood of confrontation among nation states as well as among non-state actors. Globalization will hasten the demise of totalitarian regimes yet heighten awareness in many ethnic and religious groups. It will create situations in the developing world wherein ethnic discord will rise to become the predominant basis for conflict. Globalization will also decrease control of weaker states over their peoples and result in civil wars and ethnic, religious, or cultural based insurgencies. New forms of warfare will emerge as a result of our potential future foe avoiding the traditional military power of the United States. Adversaries will seek asymmetrical or asynchronous avenues to avoid the traditional forms of confrontation. In short, the developing world will continue to be a dangerous, uncertain, and hostile place exploited for natural and human resources by global "head states."[5]

The United States will remain the lone superpower through 2015 and will continue to be looked to for global leadership.[6] Our fixed forward presence, specifically bases and installations, will decrease as a result of political pressures and reduced requirements. The locations where these bases were, notably in East Asia and in Europe, will remain relatively stable and for the most part aligned to the United States and to our global interests. This decrease in physical locations overseas will certainly increase the utility of forward-deployed joint and naval forces. Engagement, enlargement, and presence will continue to enjoin the United States to rely on her maritime superiority. Leveraging our maritime superiority as a method of applying discriminate political pressure where needed and to decrease the footprint of U. S. forces permanently assigned to overseas bases and stations.[7]

3

Amphibious warfare will remain key to influencing events ashore for the United States. The Navy and Marine Corps' relationship will continue to flourish. With the current emphasis on surface fires and new operational concepts, the integration of the Navy and Marine Corps' combat capabilities will become a reality by 2015. The Navy will increasingly provide the conditions required to permit the Marine Corps to strike operational targets ashore.[8]

The Navy-Marine Team in 2015 will have fielded many of the major end-items that are in test and evaluation at the beginning of this century. The MV22 Osprey will reach Full Operational Capability in 2014, the Advanced Amphibious Assault Vehicle (AAAV) in 2012. The LHD and the LPD 17 classes of amphibious ships will both be in full service. DD21, or a similarly configured variant, and the STOVL JSF will reach the fleet shortly after the 2015 timeframe.[9] Some of the "hardware" associated with net-centric warfare will likewise be available in the fleet.

Along with fielding new hardware will come a maturing of various operational concepts. Operational Maneuver From the Sea (OMFTS), Ship to Objective Maneuver (STOM) and sea-based logistics will have grown into operational realities. Naval doctrine likewise will mature and aircraft carrier battle groups (CVBG) will be forced to become "littoral partners" as the threat from a credible blue water navy remains unrealized.[10] Net-centric warfare concepts will have matured as well.

The U. S. Navy will necessarily remain committed to the principle of maritime dominance well beyond 2015 regardless of whether a naval competitor emerges or not. "Maritime Dominance is the naval capability that dominates the seaward extension of the littoral to provide joint and combined forces unimpeded access to areas of interest."[11] It is

indispensable in the conduct of power projection ashore and in sustaining theater air superiority. "Maritime dominance exploits information, engagement and mobility in order to position and employ a multidimensional force to gain a decisive advantage over the enemy – to control the "breadth, depth and height" of the maritime portion of the battle."[12]

The Navy's ability to execute national security policy in 2015, to deploy as a balanced, netted, and lethal force capable of conducting precision strikes against operational targets, will be based on maritime dominance in blue water and in brown.[13]

Although the Navy will not possess full net-centric capabilities, technological advances in communications and intelligence will provide the Naval Force Commander with unprecedented abilities to influence the battle space as well as to synchronize assigned forces and better leverage advantages garnered in time, force, space or information.[14] The foundations of the net-centric force being laid today will not yet have reached full maturity in 2015, but a solid foundation will exist.

The human dimension will lag technological advances and a gap between full utilization of capabilities and the commander's ability to maximize the systems available in 2015 will present challenges to the U. S. military in general. Training, experimentation, innovation, and most importantly–operational experience–will develop the flexible and agile netted force required for operational success in 2015.[15]

Not all current problems will be solved by 2015. For example, sea mines will remain a grave hazard to the Naval Force Commander. This concern will be somewhat ameliorated by the rapidity in which effects can be projected ashore as well as a better detection capability. Enemy submarines will continue to pose a danger as will anti-ship cruise missiles and, of course, weapons of mass destruction and the newer "weapons of mass distraction."[16]

Clearly, there will be "new" forms of warfare with which our successors will have to grapple.[17]

The security environment posited above will likely consist of three general military or military-like categories. First, there is traditional combat, as we know it today. U. S. Naval forces will still be required to maintain the capability of conducting some form of sea control as well as power projection in the littorals. Second, Military Operations Other Than War (MOOTW) will continue to be a commonplace mission for military forces. Third, there will be the birth of a form of war unique to the information age. Information technology will not only change the characteristics of what we know today as war, it will likely evoke a new set of activities that will become familiar to the commanders in 2015 and be generally understood as "warfare" in the 21st Century. Information warfare will become a normal and expected military action. Today, we have some difficulty in viewing this set of activities as war, or as the concern or responsibility of the Department of Defense.[18] Current planning and budgeting systems find it troublesome to address adequately these potential aspects of our future since they are not linear extensions of existing military missions and responsibilities. However, in each of these three categories cited above, the operational factors of time, space, force and information will continue to be essential to the commander and his application of power at the operational level.[19]

A Possible 2015 Amphibious Task Force. In 2015, the Amphibious Task Force will continue to provide naval presence and a broad range of combat capabilities to unified commanders. The 2015 ATF will be a force built around capabilities resident in the LHD, LPD 17 and LSD 49 class ships, as well as supporting sensors and other naval assets deemed necessary based on mission analysis and assigned tasks. Landing Craft Air Cushion (LCAC)

will remain the Task Force commander's principal surface assault craft. The Advanced Amphibious Assault Vehicle (AAAV) and MV22 Osprey aircraft provide the Naval Force Commander with the means to project decisive power against operational objectives.[20] I do not predict a one hundred-knot capable amphibious ship in service by 2015, nor do I expect a fully matured and capable netted force. There will be, however, significant changes to the force which will significantly refine its capabilities.[21]

The major changes in the 2015 force will be in the area of command, control and communications and the attendant ability to mass rapidly desired effects against selected operational targets. Communications, sensors, and intelligence collection and dissemination means will greatly increase the potency of the Naval Force Commander and will change the manner in which we consider operational factors.

The capabilities resident in a current Amphibious Task Force are well documented and cover the entire spectrum of war, from forcible entry operations to MOOTW. These are standing capabilities in the year 2000 and in 2015 will certainly remain.[22] The 2015 ATF will be, as a result of programmed ship and landing force asset enhancements illustrated above, improved force training, operational experience and enhanced C4ISR, faster both spatially and temporally than today's force.

Enhanced C4ISR will provide the situational awareness required for the coherence and coordination of maneuver elements and the "sensor-to-shooter" connectivity needed to exploit fleeting opportunities in the modern battle space. The enhanced C4ISR of 2015 will provide near-immediate linkage between the ATF and supporting agencies and forces. C4ISR is a force multiplier as it provides its possessor with clear information superiority. Enhanced C4ISR is the linchpin of the 2015 force, arguably a critical capability at the

operational level <u>and</u> a potential critical vulnerability at both operational and strategic levels. A netted system allows the commander to mass effects in space and time without necessarily massing forces in either milieu.[23]

Operational Factors. The Naval Force Commander today faces a different set of challenges regarding the operational factors of time, space and force than will his 2015 successor. Space, for example, is a major determinant of the factor time for the Naval Force Commander. Lacking true sensor-to-shooter connectivity, the current Naval Force Commander must rely on massing forces vice massing effects. While C4ISR is improving, the targeting problem still exists--specifically time between target identification and engagement. In the information age we are entering, this equates to lost opportunity. The Naval Force Commander will continue to admit time, space and force as operational factors. An additional operational factor will be included in the 2015 force, the information factor.

Information Warfare--Now and in 2015. The impact of the information age on the current Naval Force Commander is felt primarily in the areas of communications and intelligence with technological advantages being considered the sole domain of U. S. forces. This assumption, however, may not hold true in the future. As the world moves ever deeper into the information age, the U. S. military recognizes the enormous implications of an "information capable" enemy. An adversary, capable of leveraging information technology, will recognize an immediate and immense advantage. The military force that must defend against this 2015 adversary will face equally colossal disadvantages.

Consider, for example, that national homelands may no longer be regarded the sanctuaries we view them as today.[24] The basic task of a military--national defense--becomes exponentially more challenging. A homeland may be attacked directly and anonymously by

8

hostile nation-states, focused criminal organizations, or non-national actors such as ethnic groups, renegade corporations, or zealots of almost any persuasion.[25] Traditional military weapons can not be interposed between the information warfare threat and the society a military is tasked to defend. Further exacerbating the problem, in those ever-rarer instances in which traditional combat conditions exist, current kinetic weapons are only a small part of the military kit bag available to our 2015 adversary. The enemy will certainly use psychological warfare operations through access to mass media means (including the World Wide Web), friendly systems attack by sponsored "hackers" on critical C4ISR, electronic spying, monitoring, jamming and sabotage, and operational deception. This can significantly degrade a traditional force and reduce the ability of a netted force to mass effects at the critical time and place in the battle space. The intent of our current net-centric discussion, however, is to be the force that leverages this technology and thus, hopefully, avoid the stated threat.

The exploding and readily available technologies of today imply that the Naval Force Commander of 2015 must be able to accomplish the three basic information warfare missions: 1) protect our own systems, 2) attack the systems of our enemy, and 3) leverage our information superiority to gain advantage in a specific battle space.[26] The three basic tasks described above will be considered normal wartime routine for the 2015 Naval Force Commander.

Protection of our own information systems is not being seriously considered at the operational and tactical levels today. System development and the cost of hardening legacy systems are simply too prohibitive. We are only beginning to develop and refine the capability to attack our adversaries information system. The last criterion–leveraging U. S.

informational power to gain a decisive advantage in the battle space–causes the 2015 Naval Force Commander to recognize information as an operational factor along with time, space, and force. Information superiority is as essential to the operational commander in maintaining freedom of action needed for success in the battle space as is time, space, or force.

A cautionary note is in order. An individual examination of each factor is not the preferred method of analysis since each factor is related to the other. Additionally, an analysis of operational factors must be conducted under the penumbra of a stated purpose in order to provide a useful output and to lend itself to the true reason for factor analysis – synthesis of the factors as they relate to a particular purpose. For aim of our analysis, the purpose is power projection from the sea to the land against an operational or strategic objective.

I am convinced that, for the current operational commander, time is the most critical of the operational factors. Unlike force and space, time is the one truly fixed factor. Space and force are not fixed factors. Space is a relative factor that can be managed through time. Force, specifically the effects of force, likewise can be managed through the operational factor of time.

The Naval Force Commander of 2015 will look at time differently than his contemporary counterpart. Closure rates, warning time, plan development time, time required to develop intelligence, and execution time are absolute factors in the development of courses of action for the ATF today. With the future force, the factor of time will take on greater import than today since information technologies will compress it for the operational commander as well as for his adversary.

The quicker decision cycle envisioned in the netted ATF permits the Naval Force Commander to leverage time at the operational and tactical level to a much greater degree than today. If potential adversaries likewise adapt their forces and upgrade their capabilities, this temporal advantage will nonetheless remain, however, it will remain one of relativity. This advantage is different from the temporal advantage we currently possess. Its difference lies primarily in the concept of time-space, time-force, and time-information.

The 2015 commander will be faced with asymmetric and asynchronous attack options. Unlike the commander today, who wrestles with asymmetric threat, the 2015 commander, because of the increase in informational power, will face asynchronous attack as well. Time remains a critical determinant in that its impact on space and force is a driving factor in the operational commander's overall analysis. The information factor takes on an entirely different meaning to the future commander. For the 2015 operational commander, information becomes the most dominant operational factor against which time, space, and force will be measured. Information is similar to time in that it occurs along a continuum, however, the validity of information and the effect of it on the adversary can be directly related to factors time, force and space.

Time-Space. The 2015 Naval Force Commander, operating with a basically capable netted force, will be able to leverage temporal advantage to dislocate, spatially as well as psychologically, an adversary during prosecution of operations ashore. How is this the case in 2015? An example: the expanded area of influence the Naval Force Commander will enjoy becomes a potential Area of Operations with which the enemy commander must contend.[27] Current capabilities resident in an ATF present the Naval Force Commander with an area of influence that is relatively fixed. The deciding factor in the physical size of this

11

area of influence is the time it takes the Naval Force Commander to mass forces at the critical time and place balanced against delivery means and situational awareness (SA). The capabilities envisioned in the 2015 force expand this area because of a number of technical enhancements and operational concepts.

The time-space factor will be fundamentally different for the 2015 Naval Force Commander. Not only does the operational space become physically larger, the time it takes the Naval Force Commander to deliver effects, not necessarily force, within this space is reduced. This advantage is, of course, relative to the time required by the opponent to react to the Naval Force Commander's action. The time-space factor, especially in amphibious operations, is clearly to the advantage of the side that possesses the initiative. An inherent advantage of amphibious forces has historically been the freedom to select when, where, what, and how the commander will project power ashore. Clearly, the initiative lies with the netted force afloat—so long as the network remains viable.

A netted ATF reduces decision time while simultaneously increasing friendly force SA. The Naval Force Commander will be able to identify enemy operational vulnerabilities and strike faster than the enemy can protect them. Likewise, the Naval Force Commander will be able to protect ATF operational vulnerabilities (i.e. ship-to-objective maneuver, operational information systems, etc.) through increased operational depth, faster decision cycles, better SA, and subordinate awareness of ATF intent.[28] This will cause the friendly operational area of influence to increase while simultaneously decreasing the size of our adversary's and will further flatten the organizational hierarchy for execution for the ATF Commander.

Time-Force. The current view of time-force is generally thought of as a smaller force fighting a larger force and trading space for time.[29] The requirements are clear: a very large area is requisite for the smaller force to trade for time, the nature of the war must be of a protracted and traditional character, and force is measured in terms of raw combat power. The Naval Force Commander can clearly measure the factor force and in his analysis determine the optimal application of this force to achieve the operational or strategic end.

The 2015 commander will view force in a different light than his predecessor. Much like time, the analysis of force, or more precisely time-force, in the 2015 period will be sincerely impacted by the emergence of information technologies. Force is no longer merely the summation of all available "… troops, or naval forces, or air forces but also forces from all services with their required logistical support, and controlled by the operational commander."[30] For the 2015 operational level commander, force includes not only the combat forces described above. Through "reach-back" technologies, the operational commander can access economic, diplomatic, and informational power and directly leverage them in order to attain operational or strategic objectives.

Time as it relates to force will likewise be vastly different. Not only can we expect asymmetric operations to remain the norm; the 2015 commander must be prepared for asynchronous operations as well. The concept of force in 2015 will be expanded at the operational level to include those levers of power now normally associated with the strategic level. The ability of the 2015 operational level commander to reach back, in near real-time, to mass conventional combat power, information and economic power and expertise and to synchronize them in his battle space will be the lens through which time-force is analyzed.

13

"Conflict can be seen as time-competitive observation-orientation-decision-action cycles."[31] The netted Amphibious Task Force, through the use of its organic sensors, can significantly reduce the amount of time between the observation and action phases. The 2015 operational commander will have a different "Observation-Orientation-Decision-Action (OODA) Loop." The 2015 commander and his forces, with improved C4ISR and other enhancements discussed earlier, will have an "observe-act" loop. Orientation will be a near-immediate event for all netted forces. The decision will be significantly faster through the development of a Common Operating Picture, understanding commander's intent, operational decision support systems, and clear attack guidance and criteria.[32] Instead of massing force in time and space, as is required today, the netted commander will be able to mass desired effects from widely dispersed locations. The aim point of this focus of effort will be an enemy operational vulnerability.[33] Force, therefore, becomes a factor ever more intricately entwined with time and space.

Time-Information. In the suggested future security environment above, we can foresee a climate in which our enemies will seek to avoid traditional combat with United States military forces and pursue diverse strategies to constrain, moderate, or deny the U. S. a military option.[34] The use or threat of use of Weapons of Mass Destruction is the most common enemy action discussed. While this threat is real and presents a serious challenge to the military commander today, we can expect the problem to increase substantially in scope by 2015. In the information age we are entering, a potential adversary will likely employ the "newer" forms of warfare discussed earlier. Information warfare (IW) and its' subset Cybernetic warfare (CYW) and Transnational Infrastructure warfare (TIW) will join the rolls of military options or actions.[35] Appendix A contains a definition of the above-cited terms.

The operational level commander in 2015 will need to establish information superiority as a precursor to operations, much as we establish air and maritime superiority today. Information superiority is likely a more critical factor than air or sea superiority in that through information superiority flows the power of the netted force of 2015. Information superiority permits the commander to disperse his forces, yet mass them in time and space for desired effects on our adversary. The current concepts of sea and air superiority must go through an earnest reevaluation. Control of physical space might not entail physical occupation by military forces. The Mahanian concept of sea control will require a serious revisiting. Likewise, air superiority may no longer be an imperative precursor to future military operations as information will compress time, expand space, and multiply force.

Conclusion. Warfare in the 2015 information age will require equipment and mindset changes. Detailed and flexible planning, immediate coordination, near-real time and superior situational awareness, operational decision support systems that filter and fuse information very rapidly and perform simple plan extensions and revisions almost automatically, and massive database and information exchange capabilities to track both friendly and enemy situations as well as rehearse and forecast battle space dynamics and geometry are base requirements.[36]

The operational level commander of 2015, able to conduct organic long range surveillance using a variety of sensors based on small robotic platforms, will further blur the distinctions between what is considered "tactical" as opposed to "operational" and "strategic."[37] The advantages envisioned, in even a rudimentary capable netted force, can compress the operational level of war—from the top-down as well as from the bottom-up.

The easy and immediate access available to senior leadership, both civilian and military, to areas of operational activity will present the 2015 commander with a new concern, one that has yet to be addressed.

A conceivable and unplanned consequence of these projected C4ISR enhancements is the complications they can introduce to the actual task of command.[38] These complications, as stated, can result from significantly improved access to scenes of operational activity, in real or near-real time, by both political leaders and remote military leaders. Principally, the line between tactical, operational, and strategic activity may blur or erode in the face of these technical advances. We appear to be simultaneously moving forward technologically yet backwards conceptually. The 2015 commander may very well bear comparison to the pre-Napoleon commander. Seeing the entire battlefield and all forces by the commander is not a unique concept. The scale envisioned by the net-centric prophets, however, attempts to reduce fog and friction to the point that the Clausewitzian definition of "coup d'oeil" becomes a measure of bandwidth.

The operational factors of time, space, force, and information will continue to be the yardsticks by which we measure freedom of action at the operational level.[39] Their analysis will still be necessary to leverage friendly advantages and annul friendly disadvantages. It is an inescapable fact that U. S. Naval forces will hesitatingly enter the information age and develop some degree of netted capability. This distinct possibility should be a warning to practitioners of operational art. A different set of circumstances, new forms of warfare, and tasks not currently viewed as military will be the responsibility of our successors. The thinking for this force and its operational impact must begin today and it must begin in

earnest. The operational level commander will be able to, "see the entire battlefield." Is this really what we want?

NOTES

[1] Department of the Navy, <u>Naval Amphibious Warfare Plan: Decisive Power From the Sea</u> (Washington, D.C.: 1999), 9, 15, passim.

[2] Patrick M. Hughes, "A Statement for the Record, U. S. Congress, <u>Global Threats and Challenges</u>, hearing before the U. S. Congress, 4 June 1999.

[3] "Nature of Future War," Lkd, <u>National Defense University</u> at "NDU Home Page," http://www.ndu.edu/ndu/inss/books/uc/nature.html.

[4] Department of the Navy, Headquarters U. S. Marine Corps, <u>Marine Corps Doctrinal Publication 3, Expeditionary Operations</u> (MCDP 3) (Washington, D. C.: 16 April 1998), 1-26

[5] Richard Rosencrance, "The Rise of the Virtual State," <u>The United States Naval War College, National Security Decision Making Department</u>, 1999.

[6] White House. <u>A National Security Strategy for a New Century</u>. Washington D.C.: 1999, 3, 49.

[7] "Maritime Dominance," Lkd, <u>U. S. Navy Surface Warfare Division (N86)</u>, http://surfacewarfare.nswc.navy.mil/n86/index2.html.

[8] Department of the Navy, <u>Naval Amphibious Warfare Plan: Decisive Power From the Sea</u> (Washington, D.C., 1999), 22-26

[9] James A. Lasswell, "Future Technology Solutions for Today's Sea Based Power Projection Problems," <u>The Marine Corps Gazette</u>, January 1999, 25-28.

[10] Department of the Navy, <u>Naval Amphibious Warfare Plan: Decisive Power From the Sea</u> (Washington, D.C., 1999), 20.

[11] "Maritime Dominance," Lkd, <u>U. S. Navy Surface Warfare Division (N86)</u>, http://surfacewarfare.nswc.navy.mil/n86/index2.html.

[12] Ibid.

[13] Land Attack," Lkd, <u>U. S. Navy Surface Warfare Division (N86)</u>, http://surfacewarfare.nswc.navy.mil/n86/index2.html.

[14] David Alberts and others, <u>Network Centric Warfare</u>, 2d ed. (Washington, D. C.: Center for Advanced Concepts and Technologies, 1999), 54, passim.

[15] "Programs and Budget," Lkd, <u>U. S. Navy Surface Warfare Division (N86)</u>, http://surfacewarfare.nswc.navy.mil/n86/index2.html.

[16] Weapons of Mass Distraction refer to weapons and activities used to strike friendly computer and communications systems. They are specifically designed to degrade a particular capability or a broad range of capabilities. Malicious computer viruses, for example, can be considered weapons of mass distraction. Weapons of mass distraction do not necessarily cause physical destruction.

[17] Patrick M. Hughes, "A Statement for the Record, U. S. Congress, Global Threats and Challenges, hearing before the U. S. Congress, 4 June 1999.

[18] "Nature of Future War," Lkd, National Defense University at "NDU Home Page," http://www.ndu.edu/ndu/inss/books/uc/nature.html.

[19] Milan Vego, On Operational Art, 4th Draft, (Newport, RI.: The United States Naval War College, 1999), 53.

[20] Department of the Navy, Naval Amphibious Warfare Plan: Decisive Power From the Sea (Washington, D.C., 1999), 49-61.

[21] David Alberts and others, Network Centric Warfare, 2d ed. (Washington, D. C.: Center for Advanced Concepts and Technologies, 1999), 80, 161, passim.

[22] Department of the Navy, Naval Amphibious Warfare Plan: Decisive Power From the Sea (Washington, D.C., 1999), 22-27.

[23] David Alberts and others, Network Centric Warfare, 2d ed. (Washington, D. C.: Center for Advanced Concepts and Technologies, 1999), 173-174.

[24] Patrick M. Hughes, "A Statement for the Record, U. S. Congress, Global Threats and Challenges, hearing before the U. S. Congress, 4 June 1999.

[25] Ibid.

[26] Ibid.

[27] Department of the Navy, Headquarters U. S. Marine Corps, Forward. . . From the Sea, (Washington, D. C., 1995).

[28] David Alberts and others, Network Centric Warfare, 2d ed. (Washington, D. C.: Center for Advanced Concepts and Technologies, 1999), 163-167.

[29] Milan Vego, On Operational Art, 4th Draft, (Newport, RI.: The United States Naval War College, 1999), 97.

[30] Ibid, 87.

[31] This quotation is attributed to Colonel John Boyd (USAF Ret).

[32] Department of the Navy, Headquarters U. S. Marine Corps, <u>United States Marine Corps Warfighting Concepts for the 21st Century</u>, (Quantico, VA., 1998), pages V-1 to V-13.

[33] Department of the Navy, Headquarters U. S. Marine Corps, <u>Marine Corps Doctrinal Publication 1-2, Campaigning</u> (MCDP 1-2) (Washington, D. C.: 1 August 1997), 35-60.

[34] Patrick M. Hughes, "A Statement for the Record, U. S. Congress, <u>Global Threats and Challenges</u>, hearing before the U. S. Congress, 4 June 1999.

[35] Ibid.

[36] "The Operating Environment to 2015," Lkd, <u>National Defence, Canadian Navy</u> at "Canadian Navy Home Page," http://www.dnd.ca/navy/marcom/acp1toc.html.

[37] Ibid.

[38] Ibid.

[39] Milan Vego, <u>On Operational Art</u>, 4th Draft, (Newport, RI.: The United States Naval War College, 1999), 53.

APPENDIX A

1. The below definitions were culled from a statement for the record by LtGen (USA) Patrick M. Hughes, Director, Defense Intelligence Agency made 4 June 1999 entitled "Global Threats and Challenges." This statement may be found on-line at http://www.dia. mil/dr-ssci-990604.html.

Information Warfare (IW) ... actions taken to degrade or manipulate an adversary's information systems while actively defending one's own. Over the next two decades, the threat to U. S. information systems will increase as a number of foreign states and sub-national entities emphasize offensive and defensive information warfare strategies, doctrine, and capabilities.

Cybernetic warfare (CYW) ... a distinct form of information warfare involving operations to disrupt, deny, corrupt, or destroy information resident in computers and computer networks. One particularly troubling form of 'war in cyberspace' is the covert modification of an adversary's data and information systems. This form of warfare will grow in importance as technology makes new methods of attack possible. Cybernetic warfare defies traditional rules of time and distance, speed and tempo, and the conventional or traditional military capabilities of the opposing elements.

Transnational Infrastructure Warfare (TIW) ... attacking a nation's or sub-national entity's key industries and utilities – to include telecommunications, banking and finance, transportation, water, government operations, emergency services, energy and power, and manufacturing. These industries normally have key linkages and interdependencies, which could significantly increase the impact of an attack on a single component. *Threats to critical infrastructure include those from nation-states, state-sponsored sub-national groups, international and domestic terrorists, criminal elements, computer hackers, and insiders acting as agents for others.*

Asymmetric warfare ... attacking an adversary's weaknesses with unexpected or innovative means while avoiding his strengths. The concept of utilizing asymmetric approaches is as old as warfare itself. In the modern era, many forms of asymmetric attack are possible – to include the newer forms of warfare outlined above, terrorism, guerilla operations, and the use of WMD. Because of our dominant military position, *we are very likely to be the focus of numerous asymmetric strategies as weaker adversaries attempt to advance their interests while avoiding a direct engagement with the US military on our terms.* If forced into a direct conflict with the US, those same adversaries are likely to seek ways of 'leveling the playing field.'

Asynchronous warfare ... the concept of a significant time lag between attack and response. This may involve a pre-selected or delayed (timed) attack on an adversary, taking advantage of the passage of time to develop a strategic opportunity or to exploit a future vulnerability.

In a pre-selected attack, the operation has a latent effect on the adversary. Human or technical assets are strategically placed well before – sometimes years before – the actual confrontation. A delayed attack – often carried out as an act of reprisal months or even years later – may be designed to hit the enemy after his guard has been lowered.

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